contained no tannin. It was now necessary to determine which constituent of the asphalt vapor caused the precipitation of the tannin.*

It was found that slight quantities of iron were contained in the vapor and that this caused the damage. The iron was supposed to be in the form of ferrous salts or possibly in the finely divided metallic state. In the "Nachtrag" the authors report the results of trials made to determine the effect of various iron salts on rose leaves. Metallic iron in suspension failed to produce the very evident coloring of the epidermal cells; ferrum redactum caused dark spots here and there, but ferrous and ferric chloride and ferrous and ferric sulphate in solution produced a dark coloration resembling that caused by asphalt vapor. All four solutions last mentioned, with the exception of ferric chloride, brought about a precipitation of the contents of the epidermal cells. Ferric salts also injured the chlorophyll grains, turning them yellow. These experiments confirm the authors in their supposition that the injuries to the rose leaves were due to iron present in the asphalt vapor. Such papers as this are genuine contributions to vegetable pathology, and it is to be hoped that their numbers will increase in the future.—W. T. SWINGLE.

COOKE, M. C.—*Handbook of Australian Fungi.* London, 1892, pp. XXXII, 458, pl. 36.

This volume, the latest of many that have appeared from the pen of Dr. Cooke, is a useful addition to the literature on fungi, and must be welcomed by all students fortunate enough to secure a copy. Only a limited edition has been printed, and the larger part of it has gone to Australia. The reason for this is manifest from the title page, for it is there stated that the volume is "published under the authority of the several governments of the Australian colonies," "for the Departments of Agriculture in Melbourne, Brisbane, Sydney, Adelaide, Hobarton." The value of the book does not arise from any novelty of arrangement or description of new species, but in its being the collection of descriptions scattered through many widely distributed and frequently nearly inaccessible papers and monographs. It embodies the latest views of the author in regard to classification, a subject now receiving general attention from students. As will be seen, Dr. Cooke is not in entire accord with some of the newer schemes presented for acceptance.

* It is probably the weakest point in the paper that this tannin (Gerbstoff) was not more carefully studied. Le Merchant Moore has shown (On Epidermal Chlorophyll, Jour. of Bot., vol. XXV, p. 362) that the epidermis of some plants contains a substance giving the reactions of tannin with iron salts, but showing a blue or purple color with iodine and failing entirely to give the reaction for tannin with potassium bichromate, either alone or with iron salts and Millon's reagent. Kraus, however, considers this a tannin, but Dufour (Recherches sur l'amidon soluble, Bull. Soc. Vaud. d. Sci. Nat., vol. XXI, No. 93, 1886) regards it as a carbohydrate. Reinitzer (Der Gerbstoffbegriff. <Lotos, neue Folge, 11, 1891) insists that simply calling a substance tannin tells almost nothing of its real nature, especially in a case like this, where we are in doubt as to the exact reactions it gives.

The total number of species represented in the volume, exclusive of varieties, is 2087.* This, in comparison with the total number of species recorded by Saccardo, some 36,000, seems, and is, small, when the whole extent of the country covered is taken into account. But it is of course very improbable that all the Australian forms have been described. Indeed, scarcely a month passes but some new species are recorded, and it is probable that they will continue to be sent in for many years to come. The various orders are represented by species as follows:

Hymenomyceteæ	1,178
Gastromyceteæ	174
Ascomyceteæ	341
Phycomyceteæ	12
Hypodermeæ	103
Sphæropsideæ	114
Hyphomyceteæ	117
Myxomyceteæ	48

The largest order, Hymenomyceteæ, probably occupies this place because of the generally large size of the plants embraced in it. These being easily seen are naturally collected. At the same time the second order, Gastromyceteæ, has 174 out of a total known from the whole world of 650 species. "From this we conclude," Dr. Cooke remarks, "that Gastromycetes are unusually strong in Australia, certainly including some interesting genera not hitherto discovered elsewhere, but weak in subterranean species."

The occurrence of a number of species in Ceylon and Australia is noted as a curious fact in geographical distribution. For example, numerous species of *Lepiota*, a subgenus of *Agaricus*, occur in both places; others, like *Kneiffia mulleri*, *Hymenochæte strigosa*, *H. rhabarbarina*, *Stereum pusillum*, *S. sparsum*, *Coniophora murina*, *Aseröe zeylanica*, and *Epichlöe cinerea* are found nowhere else than in Ceylon and Australasia. Comparing the flora with that of Europe, Dr. Cooke finds that of the Hymenomycetes 332 are exclusively Australian, 472 are Australian and European, and 370 are common to Australia and some other country exclusive of Europe. Of the Gastromycetes only 31 out of 173 species are European. The Myxomycetes are still regarded as fungi, notwithstanding the efforts to separate them as *Mycetozoa*.

A useful portion of the introduction consists of condensed accounts of the principal groups, with tables of the genera. This, while not claiming to be complete, can not but be of assistance in recognizing the larger groups and the genera. The species will have to be studied up from the descriptions. These, however, are well supplemented by 36 plates, with 377 figures. Twenty plates, with 175 figures, are colored.

*The slight discrepancy between this number and that given by Dr. Cooke in the introduction is due to the addition here of a few interpolated and duplicate numbers left out of his count in the general total.

These include the three groups, Hymenomycetes, Gastromycetes, and Discomycetes. In the second of these are some peculiar Phalloids and Lycoperdaceæ. Among the latter is *Podaxis indica*, which bears a surprising outward resemblance to *Coprinus comatus*, although, of course, the interior structure is widely different. There is also *Xylopodium ochroleucum*, with a long stalk and a peridium marked with angular projections.

Only one change seems to have been proposed in nomenclature. This is the substitution of *Platycheilus* for *Tryblidiopsis*, preoccupied. A list of authorities cited and a full index are valuable portions of the book. The descriptions of the plates would have been more convenient for reference had the pages where each species is described been given.—JOSEPH F. JAMES.

HABERLANDT, G.—*Eine botanische Tropenreise: Indo-Malayische vegetationsbilder und Reiseskizzen.* Pp. VII, 300, fig. 51. Leipzig, 1893.

An account of a six months' trip from Triest to Java via Bombay and Singapore, and return via Ceylon and Egypt. Most of the time, November to February, was spent in the hot, rainy region of West Java, where the yearly rainfall is 4½ meters, and the mean annual temperature 25° C., with a difference of only 1° between the mean of the warmest month, September, and that of the coldest, February. In spite of what would seem to be favorable conditions, parasitic fungi in West Java are comparatively rare. The author thinks this may be due to the fact that the spores do not find lodgment, the foliage on a great many plants being thick, hard, and smooth, so as to be washed clean by the daily rains and quickly dried. If the leaves were hairy, so as to hold the spores and retain moisture, the opportunities for attack would be better. In some of the thickets the growth from the interweaving of lianas is so dense that fallen branches and foliage do not reach the ground, but gather in masses, like thatch of roofs, and over and through these, anchoring here and there, clambers the black and brown liana-like mycelium of a fungus resembling *Marasmius*—fungus-lianas, the author calls them.

During the nine days spent in Ceylon the following facts were gathered relative to the coffee rust (*Hemileia vastatrix*). The extensive and beautiful coffee plantations so graphically described by Haeckel, have been almost entirely destroyed and the land is now devoted to other purposes, e. g., tea-growing. The first coffee plantation was set out in 1825, and the business proved so remunerative that a vast extent of upland country was devoted to it, and coffee-growing and speculation became the rage. The leaf rust appeared in the seventies, and no radical means were found to check its rapid spread. The influence of this disease was felt in every branch of business and a great many people were financially ruined. Many of the plantations can now be had for one-tenth their former value, and the total depreciation in real estate